

THIN SECTION LABEL ID: **368-U1502A-40R-1-W 0/3-TSB-TS23** Thin section no.: 23
 Observer: KAD/FMZ Unit/subunit: IV
 Thin section summary: Matrix-supported breccia, with 80% siliciclastic material and 20% biogenic carbonate. Larger fragments (probably altered igneous) consist of clay and sheet silicates, e.g., epidote, Fe hydroxides, and potentially chlorite.

Plane-polarized: 41571101

Cross-polarized: 41571121



Sediments and Sedimentary Rock

Sample domain name:

Domain rel. abundance:

Lithology: matrix-supported breccia

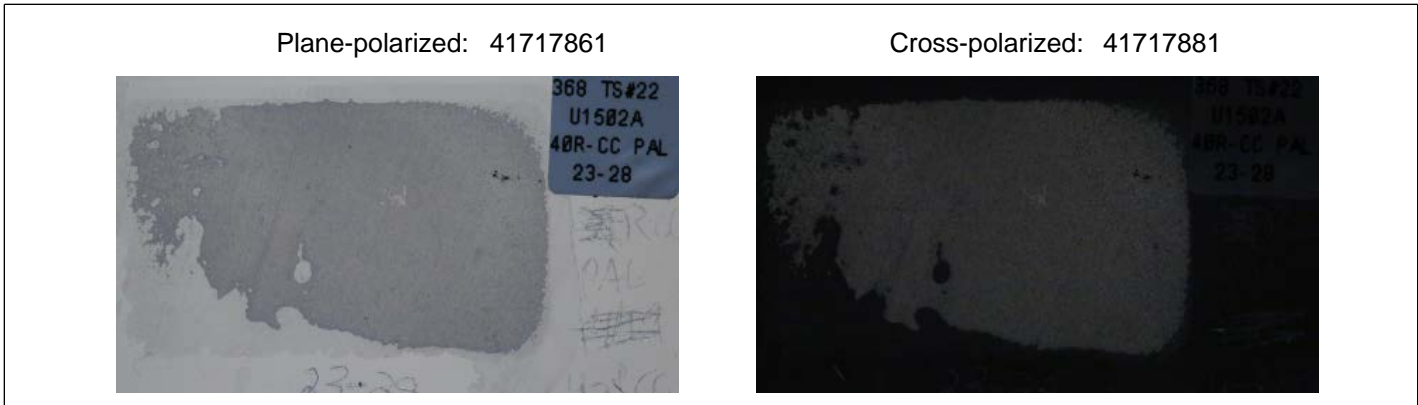
TEXTURE	Percent	CONSTITUENT	Percent	GRAIN ROUNDNESS	
Gravel texture	30	Siliciclastics	80	Mineral grains	
Sand texture	20	Detrital carbonate			
Silt texture	10	Biogenic carbonate	20		
Clay texture	40	Biogenic silica			

Framework grain abundance

D=dominant; A=abundant; C=common; R=rare; Tr=trace

Component	Rel. abundance	Component	Rel. abundance
Quartz	R	Calcite (allogenic)	C
Feldspar		Mica	
Clay minerals	A	Glauconite	
Lithic grains	A	Foraminifera	
Chert		Undifferentiated calcareous bioclasts	

THIN SECTION LABEL ID: **368-U1502A-40R-CC-PAL(23-28)-TSB-TS22** Thin section no.: 22
 Observer: FMZ/RMK Unit/subunit: V
 Thin section summary: Fine-grained dolomite marble with calcite enclave and magnetite bands and conglomerates. Equigranular annealing texture.



Metamorphic Petrology

Domain no.: 1 Domain relative abundance (%): 100

Lithology:	dolomite marble	Contact Type:	chilled contact
Texture:	annealing	Grain Size Distribution:	equigranular

Texture Comment: Clear triple junctions between the grains

Mineral	Present (%)	Size min. (mm)	Size Max (mm)	Size Mode (mm)	Shape	Habit	Comments
Calcite	2	0.02	0.05	0.04	anhedral	granular	
Dolomite	95	0.01	0.04	0.03	anhedral	granular	
Oxides	3	0.01	0.025	0.015	subhedral	equant	Magnetite (cubic shape and high magnetic susceptibility of the unit)

THIN SECTION LABEL ID: **368-U1502A-41R-1-W 1/4-TSB-TS24** Thin section no.: 24
 Observer: RMK Unit/subunit: V
 Thin section summary: Variably hydrothermally altered fine-grained meta-claystone. Less altered domains preserve primary clay assemblage, whereas highly altered domains might be addressed as a chlorite-epidote-schist. Epidote occurs in the form of porphyroblasts and veins.

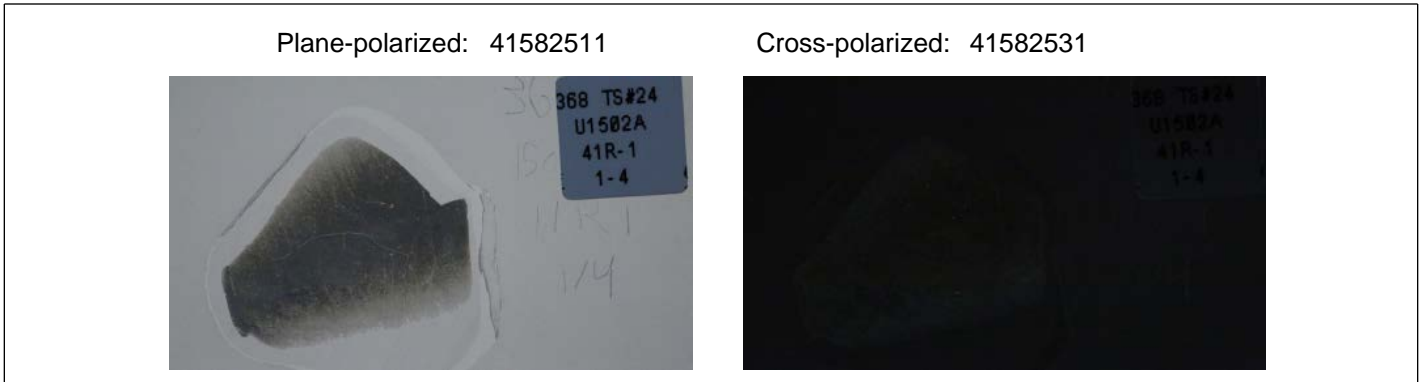


Veins and Halos

Vein type: Vein boundary: sharp boundary or contact
 Avg. thickness (cm): 0.003 Vein texture:

Vein fill composition	Percentage
Epidote	100

THIN SECTION LABEL ID: **368-U1502A-41R-1-W 1/4-TSB-TS24** Thin section no.: 24
 Observer: RMK Unit/subunit: V
 Thin section summary: Variably hydrothermally altered fine-grained meta-claystone. Less altered domains preserve primary clay assemblage, whereas highly altered domains might be addressed as a chlorite-epidote-schist. Epidote occurs in the form of porphyroblasts and veins.



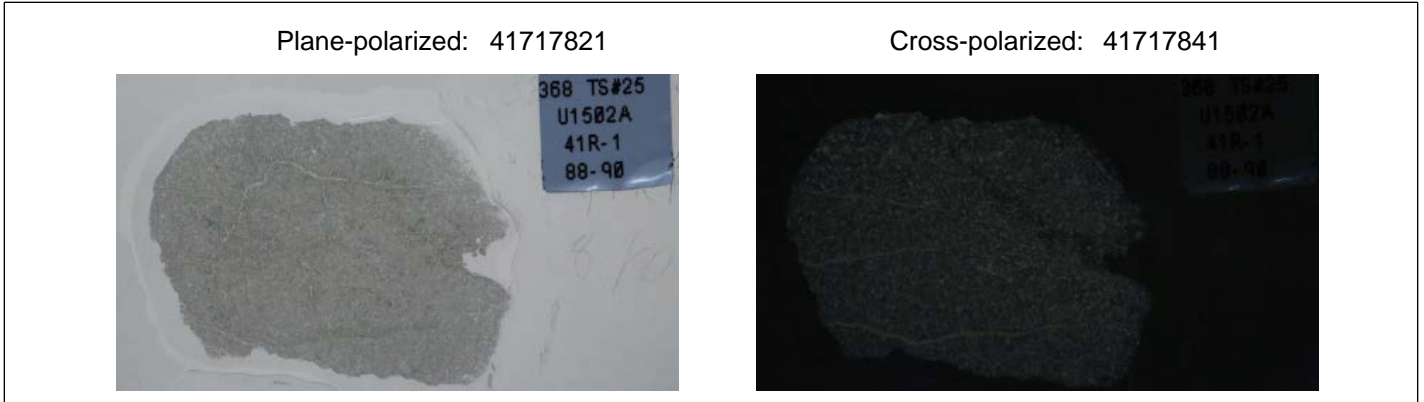
Sediments and Sedimentary Rock

Sample domain name: Domain rel. abundance:
 Lithology: meta claystone

Framework grain abundance
 D=dominant; A=abundant; C=common; R=rare; Tr=trace

Component	Rel. abundance	Component	Rel. abundance
Quartz		Calcite (allogenic)	
Feldspar		Mica	
Clay minerals	A	Glauconite	
Lithic grains		Foraminifera	
Chert		Undifferentiated calcareous bioclasts	

THIN SECTION LABEL ID: **368-U1502A-41R-1-W 88/90-TSB-TS25** Thin section no.: 25
 Observer: FMZ/DWP/GM Unit/subunit: 2a
 Thin section summary: Highly altered (hydrothermal?) basalt. Fine-grained inequigranular texture with elongate plagioclase (sericitized), subequant pyroxene (altered to phyllosilicates), Fe-Ti oxides (partly replaced by Fe hydroxides) and mesostasis (completely altered groundmass consist of 30% colourless-greenish minerals with high interference colours, and veins with fibrous minerals).



Igneous Petrology

Lithology: basalt Groundmass grain size (avg.): fine-grained
 Texture: intergranular Grain size distribution:

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	45	5	40	0.05	1.5	subhedral	elongate	Highly altered. Rare carlsbad-twinning. Little undolose extinction.
Clinopyroxene	35	1	34	0.05	0.3	subhedral	subequant	
Fe-Ti oxide	5	4	1	0.02	0.1	subhedral	subequant	oxidized

THIN SECTION LABEL ID: **368-U1502A-41R-2-W 42/44-TSB-TS26** Thin section no.: 26
 Observer: DWP/FMZ Unit/subunit: 2a
 Thin section summary: Highly altered (hydrothermal?) moderately vesicular basalt. Fine-grained inequigranular texture with elongate plagioclase (sericitized), subequant pyroxene (altered to phyllosilicates) and Fe-Ti oxides (partly hydroxized). Vesicles are filled with alteration minerals.

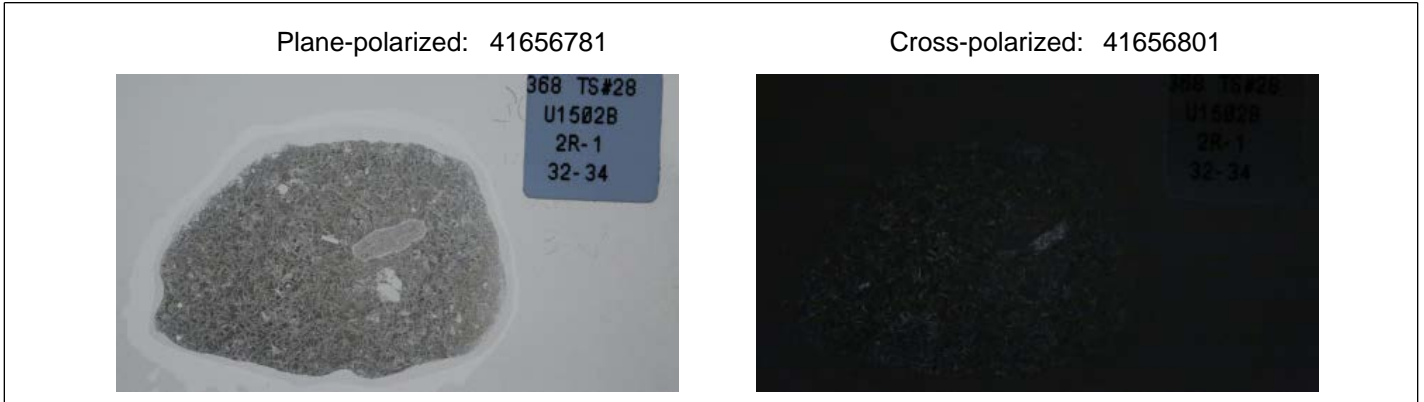


Igneous Petrology

Lithology: basalt **Groundmass grain size (avg.):** fine-grained
Texture: intergranular **Grain size distribution:** inequigranular

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	55	15	40	0.05	0.7	subhedral	elongate	Highly altered. Little undulose extinction. Common carlsbad twins.
Clinopyroxene	40	5	35	0.05	0.3	subhedral	subequant	
Fe-Ti oxide	5	4	1	0.02	0.1	subhedral	subequant	oxidized

THIN SECTION LABEL ID: **368-U1502B-2R-1-W 32/34-TSB-TS28** Thin section no.: 28
 Observer: SMS, RMK, FMZ, KAD
 Unit/subunit: II/1
 Thin section summary: Sparsely plagioclase phyric fine-grained basalt. Highly altered. Epidote group minerals (Czo?) are common as matrix components and sometimes occur as subhedral allanite with Czo rims. Plagioclase only recognizable phenocryst. Groundmass dominated by tightly interwoven plagioclase laths. Plagioclase may be partially replaced. Interstitial space taken up secondary mineral (clay? zeolites Fe-(hydr)oxides). Plagioclase in the groundmass show quench textures. Possible pseudomorphs after olivine that are now brown clay minerals.



Igneous Petrology

Lithology: sparsely plagioclase phyric basalt **Groundmass grain size (avg.):** fine-grained
Texture: interstitial **Grain size distribution:** inequigranular

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	2	0.1	1.9	1.3	6	euhedral	tabular	twinned, needly plagioclase laths tightly interwoven; plagioclase always altered; plagioclase phenocrysts may be broken out due to preparation or possibly alteration

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	50	40	10	0.1	1	euhedral	elongate	twinned, needly plagioclase laths tightly interwoven; plagioclase always altered
Fe-Ti oxide	10	5	5	0.005	0.02	subhedral	subequant	

Alteration

Alteration intensity: high **Total alteration (%):** 50 **Domain ID (if >1):**

Alteration mineral	Percent	Comments
Clay, other	45	possible from hyaline groundmass;
Epidote	10	Non-plagioclase matrix components seem to largely be replaced by epidote group minerals (Czo?). Larger subhedral allanite porphyroblasts show clinozoisite rims.
Oxide, other	5	present in interstitial spaces, not clear whether entirely secondary
Zeolite		radially filling in pore space, which may be primary (vesicles?) or may have created by alteration

THIN SECTION LABEL ID: **368-U1502B-2R-1-W 54/56-TSB-TS29**

Thin section no.: 29

Observer: SMS, RMK

Unit/subunit: III

Thin section summary: Highly silicified tectonic breccia. Cataclastic quartz microstructure with fractal grain size distribution largely thermally overprinted under static conditions (annealed). Protolith possibly nannofossil-rich clay with foraminifera. Secondary Fe-hydroxide possibly outlining foraminifera tests. Pervasively silicified and extensive Fe-hydroxide staining.

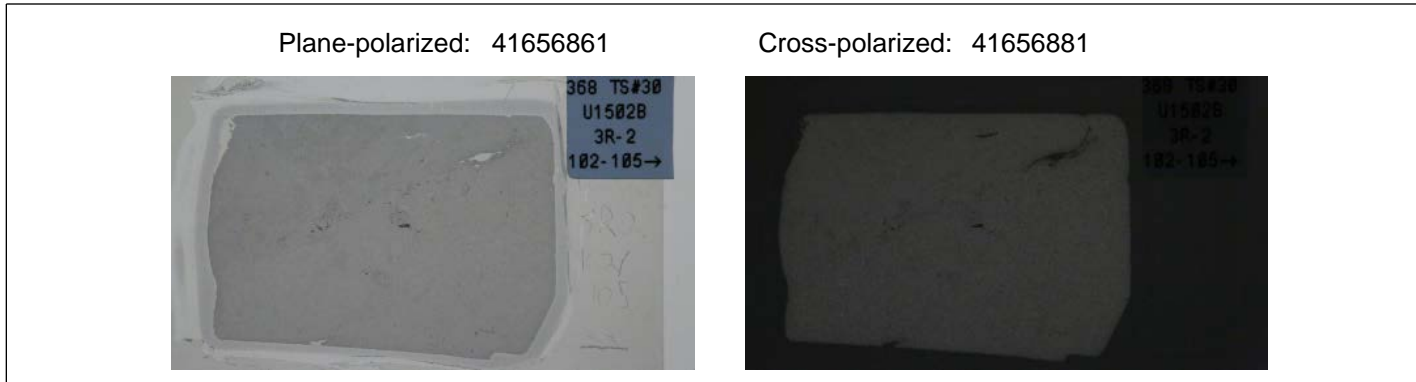
Plane-polarized: 41656821



Cross-polarized: 41656841



THIN SECTION LABEL ID:	368-U1502B-3R-2-W 102/105-TSB-TS30	Thin section no.:	30
Observer:	SMS, RMK, FMZ	Unit/subunit:	V
Thin section summary:	Dolomite. Equigranular, recrystallized. Some secondary epidote group minerals (czo or allanite?), Fe-oxides (probably magnetite due to high magnetic susceptibility), and zeolites(?) along fractures		

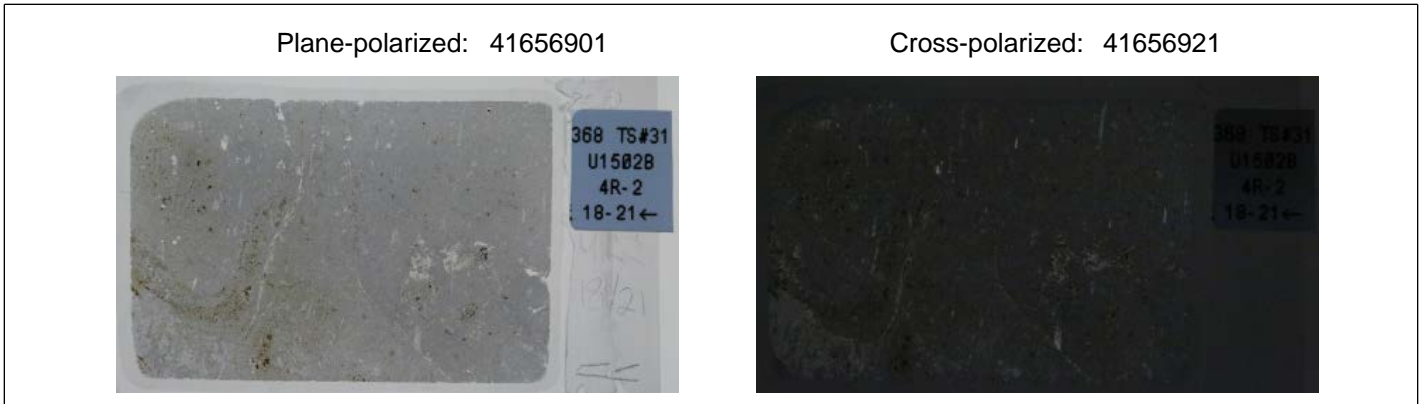


Sediments and Sedimentary Rock

Sample domain name: _____ Domain rel. abundance: _____

Lithology: dolomite

THIN SECTION LABEL ID: **368-U1502B-4R-2-W 18/21-TSB-TS31** Thin section no.: 31
 Observer: SMS, RMK, FMZ
 Unit/subunit: VIb/2a
 Thin section summary: Sparsely plagioclase phyric fine-grained basalt. Highly altered. Plagioclase only recognizable phenocryst. Groundmass dominated by tightly interwoven plagioclase laths with quench textures. Plagioclase is partially replaced by dolomite and zeolite. Interstitial space taken up secondary minerals (dolomite, zeolites, clay?, epidote). Veins filled by dolomite, epidote, zeolites and secondary plagioclase. Diffuse Fe-hydroxide halos.



Igneous Petrology

Lithology: sparsely plagioclase phyric basalt **Groundmass grain size (avg.):** fine-grained
Texture: interstitial **Grain size distribution:** inequigranular

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	2	0.2	1.8	0.8	1.5	euhedral	subequant	Carlsbad twinning common, rare albite twins

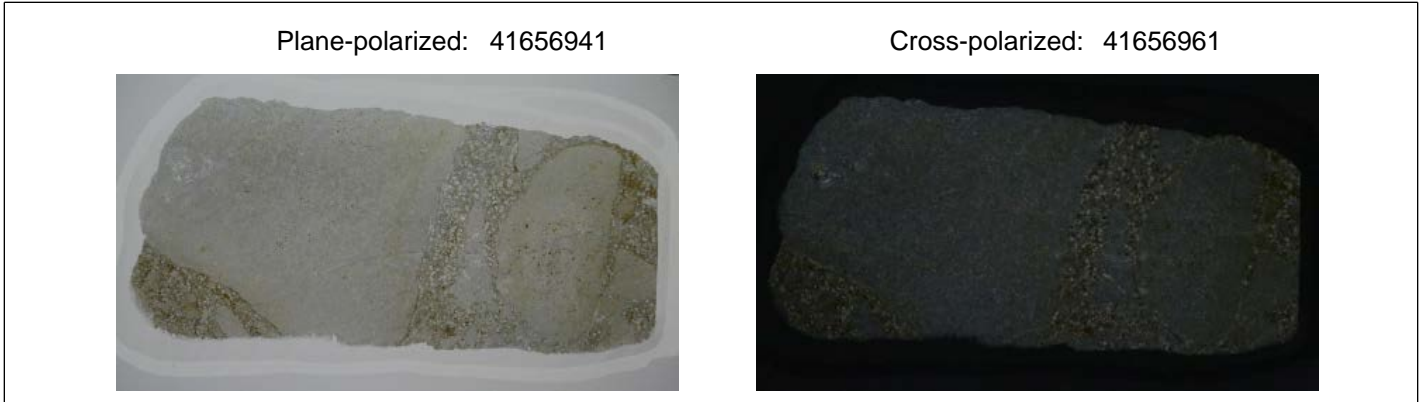
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	50	20	30	0.1	0.5	euhedral	elongate	twinning, needly plagioclase laths tightly interwoven; plagioclase always altered
Fe-Ti oxide	5	2	3	0.01	0.1	subhedral	equant	

Alteration

Alteration intensity: high **Total alteration (%):** 70 **Domain ID (if >1):**

Alteration mineral	Percent	Comments
Calcium carbonate	10	probably mostly dolomite, veins and pore space fillings
Clay, other	30	
Epidote	0.1	just one grain
Oxide, other	5	
Zeolite	5	vesicles fillings, in groundmass

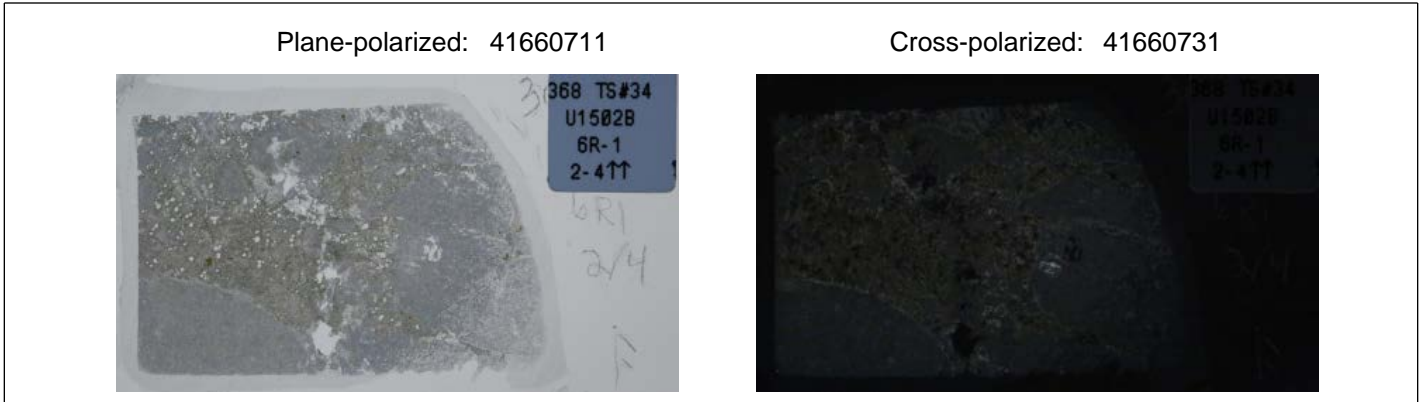
THIN SECTION LABEL ID:	368-U1502B-5R-CC-W 29/34-TSB-TS32	Thin section no.:	32
Observer:	RMK, GM	Unit/subunit:	V1b/2a
Thin section summary:	Basaltic breccia. Hydrothermally altered basalt clasts show a low-grade facies mineral assemblage mainly consisting of strongly altered plagioclase into sericite and epidote (czo, allanite?) with relic cpx and plagioclase phenocrysts and cross-cutting dolomite vein. Breccia matrix consists of euhedral dolomite crystals, calcite, epidote, Fe-(hydr)oxides, quartz, zeolites, and other accessory alteration minerals such as clay.		



Igneous Petrology			
Lithology:	basaltic breccia	Groundmass grain size (avg.):	fine-grained
Texture:	porphyritic	Grain size distribution:	bimodal

Alteration			
Alteration intensity:	high	Total alteration (%):	80
		Domain ID (if >1):	clast
Alteration mineral	Percent	Comments	
Epidote	50		
Sericite	40		
Zeolite	30	radially filling of 'hole', which may be primary (vesicles?)	

THIN SECTION LABEL ID: **368-U1502B-6R-1-W 2/4-TSB-TS34** Thin section no.: 34
 Observer: SMS, FMZ, KAD
 Unit/subunit: VIb/2a
 Thin section summary: Brecciated basalt with dolomite and zeolite veins. Basalts 'clasts' are sparsely plagioclase phyric fine-grained basalt with quench textures. Highly altered. Plagioclase only recognizable phenocryst. Groundmass dominated by tightly interwoven plagioclase laths. Plagioclase is partially replaced by dolomite, zeolite, epidote. Interstitial space filled with secondary minerals (dolomite, zeolites, clay?). Veins filled by dolomite, epidote, zeolites and secondary plagioclase.



Igneous Petrology
 Lithology: brecciated basalt Groundmass grain size (avg.):
 Texture: Grain size distribution:

Igneous Petrology
 Lithology: basalt Groundmass grain size (avg.): fine-grained
 Texture: interstitial Grain size distribution: equigranular

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	60	30	30	0.02	0.7	subhedral	elongate	abundant twinning, common undulose extinction
Fe-Ti oxide	10	8	2	0.01	0.05	subhedral	equant	

Alteration
 Alteration intensity: high Total alteration (%): 80 Domain ID (if >1): clast

Alteration mineral	Percent	Comments
Clay, other	50	most of groundmass altered to clay
Epidote	20	Large part of matrix replaced by green/yellow minerals with high (yellow-pink-blue) interference colour: epidote group minerals.
Zeolite	1	radially filling of 'hole', which may be primary (vesicles?)

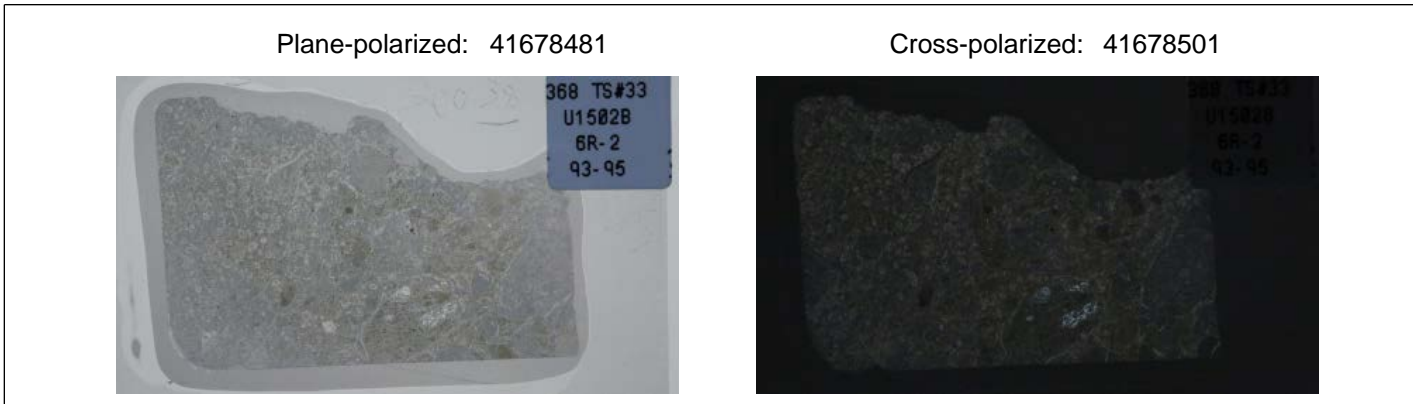
Alteration

Alteration intensity: complete **Total alteration (%):** 80 **Domain ID (if >1):** groundmass

Alteration domain comment: brecciated matrix filled by dolomite, epidote, zeolites and secondary plagioclase.

Alteration mineral	Percent	Comments
Calcium carbonate	60	probably mostly dolomite, veins and pore space fillings
Clay, other	30	
Epidote	1	

THIN SECTION LABEL ID: **368-U1502B-6R-2-W 93/95-TSB-TS33** Thin section no.: 33
 Observer: SMS, FMZ, KAD
 Unit/subunit: VIb/2a
 Thin section summary: Basalt breccia with dolomite and clay minerals. Residual basalt 'clasts' are subangular, microcrystalline to porphyritic, in various stages of alteration, from at least partially altered phenocrysts until nearly completely replaced by secondary minerals; embedded in brecciated mixture of fine-grained phenocrysts and smaller basaltic clasts, that are partially transformed to clays?, mostly completely overprinted by dolomite, calcite, secondary albite?, clay minerals?, quartz? traces of epidote. Some clasts of very fine-grained silty claystone.



Igneous Petrology
 Lithology: brecciated basalt Groundmass grain size (avg.):
 Texture: Grain size distribution:

Igneous Petrology
 Lithology: sparsely plagioclase phyric basalt Groundmass grain size (avg.): fine-grained
 Texture: porphyritic Grain size distribution: inequigranular

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	2	0.5	1.5	0.6	5	euhedral	tabular	common twins and undulose extinction

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	60	20	40	0.2	0.7	euhedral	elongate	common Carlsbad twins, some undulose extinction
Fe-Ti oxide	5	0	5	0.01	0.1	subhedral	equant	replaced by Fe-hydroxides

Alteration
 Alteration intensity: complete Total alteration (%): 80 Domain ID (if >1): groundmass
 Alteration domain comment: brecciated part, transformed to claystone? and mostly completely overprinted by dolomite/calcite (in nodule form), secondary albite?, clay minerals?, quartz? traces of epidote, hydroxides.

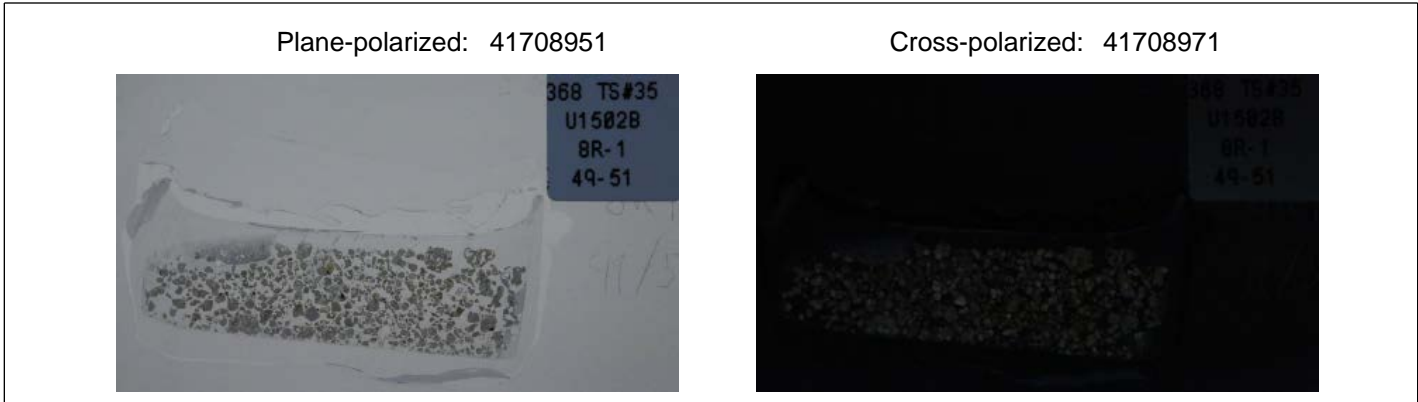
Alteration mineral	Percent	Comments
Calcium carbonate	30	probably mostly dolomite, veins and pore space fillings
Clay, other	60	most of groundmass altered to clay
FeOOH	2	most of groundmass altered to clay

Alteration

Alteration intensity: high **Total alteration (%):** 80 **Domain ID (if >1):** clast

Alteration mineral	Percent	Comments
FeOOH	5	in interstitial space, probably replacing Fe-oxides
Zeolite	50	in interstitial spaces and replacing phenocrysts

THIN SECTION LABEL ID: **368-U1502B-8R-1-W 49/51-TSB-TS35** Thin section no.: 35
 Observer: SMS, FMZ Unit/subunit: VIb/2a
 Thin section summary: Secondary minerals (dolomite/siderite, clay minerals, Fe-hydroxides) formed by hydrothermal alteration of basalt; mineral mound of not well consolidated matrix in between basalt clasts.



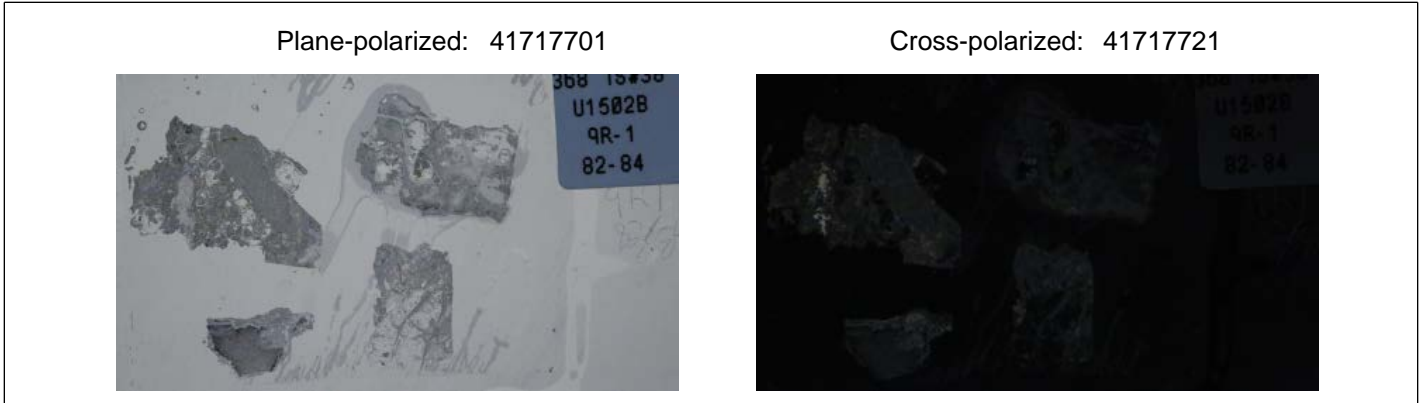
Igneous Petrology
 Lithology: brecciated basalt Groundmass grain size (avg.):
 Texture: Grain size distribution:

Alteration
 Alteration intensity: complete Total alteration (%): 100 Domain ID (if >1): groundmass
 Alteration domain comment: dolomite and clay matrix with Fe-hydroxides

Alteration mineral	Percent	Comments
Calcium carbonate	50	dolomite
Clay, smectite	25	partially replacing dolomite
Clay, other	22	
FeOOH	3	

Vesicle fill composition	Percent
Clay, smectite	25

THIN SECTION LABEL ID: **368-U1502B-9R-1-W 82/84-TSB-TS38** Thin section no.: 38
 Observer: SMS, FMZ
 Unit/subunit: VIb/2a
 Thin section summary: Highly altered sparsely plagioclase-phyric basaltic clasts in lithified matrix of zeolite, dolomite, epidote and clay. Groundmass consists of felty plagioclase up to 0.6 mm long.



Igneous Petrology

Lithology: sparsely plagioclase phyric basalt **Groundmass grain size (avg.):** fine-grained
Texture: interstitial **Grain size distribution:** equigranular

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	5	2	3	0.4	1.8	subhedral	tabular	some carlsbad twinning

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	60	30	30	0.1	0.6	euheral	elongate	tightly interwoven, felty plagioclase needles, with interstitial alteration minerals.

Igneous Petrology

Lithology: brecciated basalt **Groundmass grain size (avg.):**
Texture: **Grain size distribution:**

Alteration

Alteration intensity: high **Total alteration (%):** 90 **Domain ID (if >1):** clast

Alteration domain comment: higher interference colour alteration mineral: chlorite/actinolite/epidote?

Alteration mineral	Percent	Comments
Chlorite	30	replaces groundmass and plagioclase phenocrysts; is followed by calcite/dolomite and epidote

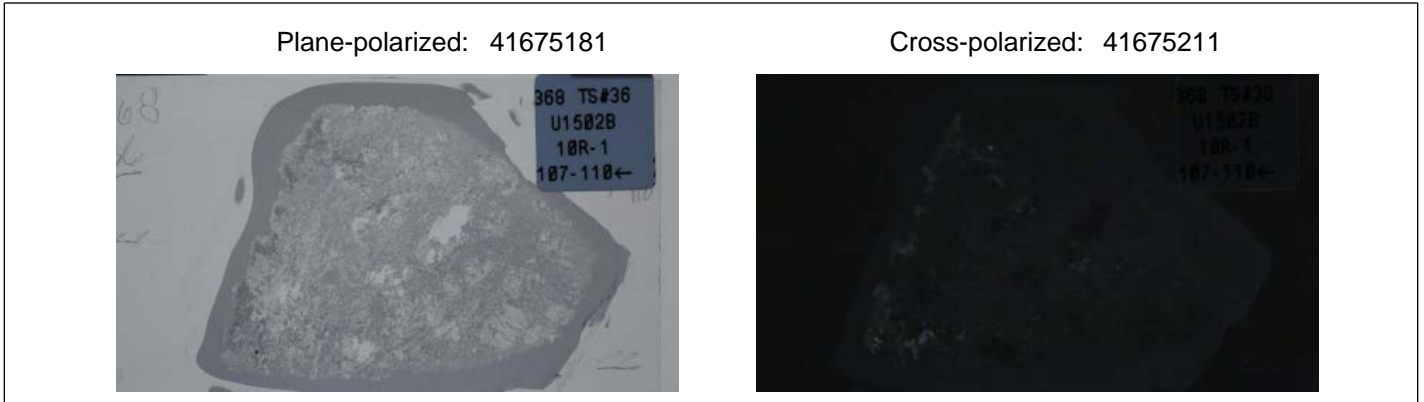
Alteration

Alteration intensity: complete **Total alteration (%):** 90 **Domain ID (if >1):** groundmass

Alteration domain comment: zeolite, dolomite and clay

Alteration mineral	Percent	Comments
Calcium carbonate	45	dolomite
Clay, other	50	
Quartz	5	vein

THIN SECTION LABEL ID: **368-U1502B-10R-1-W 107/110-TSB-TS36** Thin section no.: 36
 Observer: SMS
 Unit/subunit: VIb/2a
 Thin section summary: Plagioclase-phyric basalt with large mm-sized plagioclase that are nearly completely sericitized. Groundmass is transformed to clay and sericite beyond recognition of original textures. Cut by quartz and carbonate veins.



Igneous Petrology

Lithology: moderately plagioclase phyric basalt **Groundmass grain size (avg.):** fine-grained

Texture: porphyritic **Grain size distribution:** bimodal

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	10	2	8	0.5	5	euhedral	equant	widely and nearly completely sericitized

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase								presumably plagioclase in the groundmass, but not longer recognizable, as completely altered (into clay?)

Alteration

Alteration intensity: high **Total alteration (%):** 95 **Domain ID (if >1):**

Alteration mineral	Percent	Comments
Calcium carbonate	5	
Clay, smectite	50	most of groundmass altered to clay
Sericite	30	all the plagioclase is at least partially, if not completely turned into sericite

Vesicle fill composition	Percent
Clay, smectite	50

THIN SECTION LABEL ID: **368-U1502B-10R-CC-W 10/13-TSB-TS37** Thin section no.: 37
 Observer: SMS, FMZ, KAD
 Unit/subunit: VIb/2a
 Thin section summary: Very fine-grained, quench-textured, altered basalt cut by quartz and dolomite veins, with pyrite. Basalt 'clasts' being replaced by dolomite. Traces of epidote. Traces of sericite?



Igneous Petrology

Lithology: basalt **Groundmass grain size (avg.):** fine-grained
Texture: interstitial **Grain size distribution:** equigranular

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	2	1	1	0.5	1	euhedral	elongate	

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	80	30	50	0.2	0.4	euhedral	elongate	felty, tightly interwoven, widely replaced
Fe-Ti oxide	5	0	5	0.01	0.05	subhedral	equant	replaced by Fe-hydroxides

Igneous Petrology

Lithology: brecciated basalt **Groundmass grain size (avg.):**
Texture: **Grain size distribution:**

Alteration

Alteration intensity: complete **Total alteration (%):** 90 **Domain ID (if >1):** groundmass
Alteration domain comment: dolomite, quartz, little calcite and abundant pyrite and clay minerals.

Alteration mineral	Percent	Comments
Calcium carbonate	30	dolomite
Clay, other	50	
Quartz	10	
Sulfide, pyrite	10	in patches of singular grains. euhedral

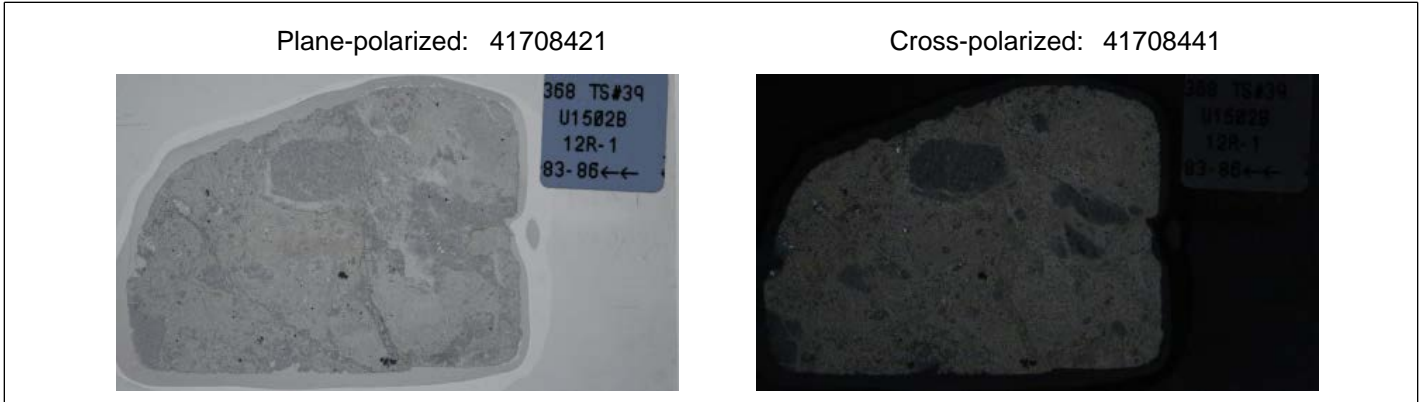
Alteration

Alteration intensity: high **Total alteration (%):** 90 **Domain ID (if >1):** clast

Alteration mineral	Percent	Comments
Clay, smectite	50	
Sulfide, pyrite	2	euhedral sulfide grains in some basalt clasts

Vesicle fill composition	Percent
Clay, smectite	50

THIN SECTION LABEL ID: **368-U1502B-12R-1-W 83/86-TSB-TS39** Thin section no.: 39
 Observer: FMZ Unit/subunit: VIb/2a
 Thin section summary: Clast of fine-grained basalt in a matrix of fine crystalline, recrystallised (triple junctions) dolomite/siderite. Clasts are highly altered, with a matrix of plagioclase laths, alteration clay minerals, epidote and oxides. Dolomite/siderite domains contain apart from dolomite/siderite, residual plagioclase, sulfides (pyrite), clay minerals and minor quartz. The rims around the basalt clasts are dominated by clay.



Igneous Petrology

Lithology: basalt Groundmass grain size (avg.): fine-grained
 Texture: interstitial Grain size distribution: equigranular

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	50	20	30	0.05	0.5	subhedral	elongate	some carlsbad twins and undulose extinction
Fe-Ti oxide	2	1	1	0.01	0.08	euhedral	equant	

Igneous Petrology

Lithology: brecciated basalt Groundmass grain size (avg.):
 Texture: Grain size distribution:

Alteration

Alteration intensity: high Total alteration (%): 90 Domain ID (if >1): clast

Alteration mineral	Percent	Comments
Clay, other	50	most of groundmass altered to clay
Epidote	20	Large part of matrix replaced by green/yellow minerals with high (yellow-pink-blue) interference colour: epidote group minerals.
Sulfide, pyrite	2	euhedral sulfide grains

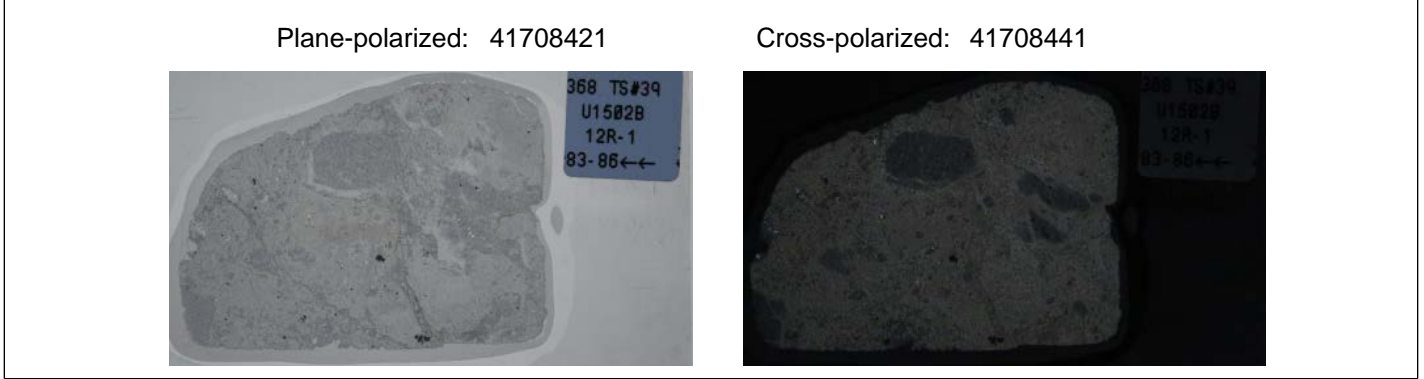
Alteration

Alteration intensity: complete **Total alteration (%):** 90 **Domain ID (if >1):** groundmass

Alteration domain comment: dolomite matrix, almost completely replaced basalt.

Alteration mineral	Percent	Comments
Calcium carbonate	80	dolomite
Clay, other	15	around basalt clasts
Sulfide, pyrite	1	euhedral sulfide grains

THIN SECTION LABEL ID: **368-U1502B-12R-1-W 83/86-TSB-TS39** Thin section no.: 39
 Observer: FMZ Unit/subunit: V1b/2a
 Thin section summary: Clast of fine-grained basalt in a matrix of fine crystalline, recrystallised (triple junctions) dolomite/siderite. Clasts are highly altered, with a matrix of plagioclase laths, alteration clay minerals, epidote and oxides. Dolomite/siderite domains contain apart from dolomite/siderite, residual plagioclase, sulfides (pyrite), clay minerals and minor quartz. The rims around the basalt clasts are dominated by clay.



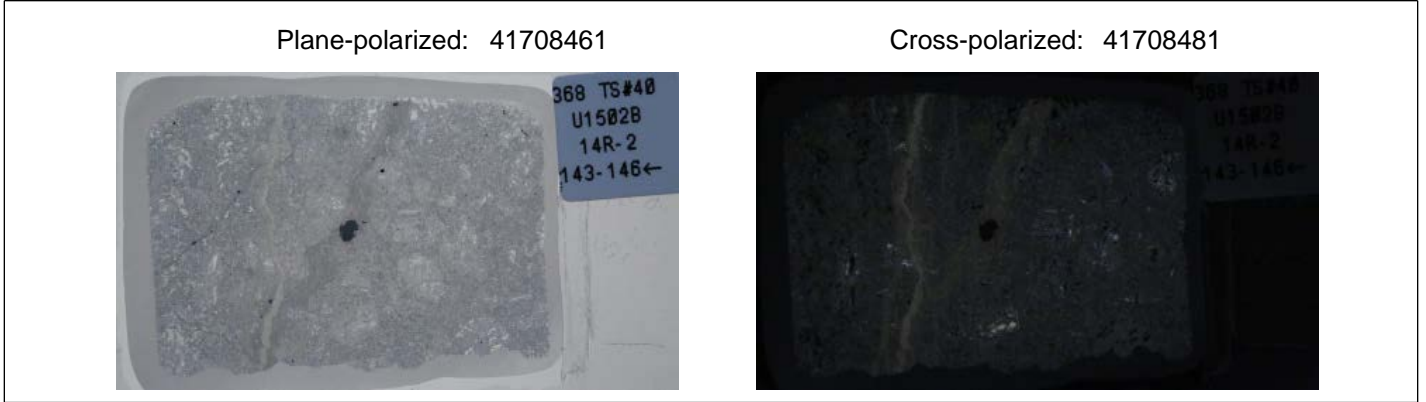
Sediments and Sedimentary Rock

Sample domain name: carbonate matrix Domain rel. abundance: 75
 Lithology: dolomite

Framework grain abundance
 D=dominant; A=abundant; C=common; R=rare; Tr=trace

Component	Rel. abundance	Component	Rel. abundance
Quartz	R	Calcite (allogenic)	
Feldspar	C	Mica	
Clay minerals	C	Glauconite	
Lithic grains		Foraminifera	
Chert		Undifferentiated calcareous bioclasts	

THIN SECTION LABEL ID: **368-U1502B-14R-2-W 143/146-TSB-TS40** Thin section no.: 40
 Observer: SMS
 Unit/subunit: VIb/2b
 Thin section summary: Highly altered, highly porphyritic basalt. Large mm-sized euhedral phenocrysts of subequant plagioclase with partially glomeroporphyritic textures. Highly altered with mostly clay minerals, cross-cut by calcite and dolomite-rich veins. Pervasive sericite and clay minerals (+ epidote/chlorite?) in groundmass. Pyrite-impregnated.



Igneous Petrology

Lithology: highly plagioclase phyric basalt **Groundmass grain size (avg.):** fine-grained
Texture: interstitial **Grain size distribution:** seriate

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	30	2	28	1	6	euhedral	subequant	abundant calcsad and albit twinning

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	30	2	28	0.5	1	subhedral	tabular	very difficult to recognize shapes or original texture as much altered to clay

Alteration

Alteration intensity: high **Total alteration (%):** 100 **Domain ID (if >1):**

Alteration domain comment: mostly clay minerals, some calcite or dolomite, sulfide impregnated

Alteration mineral	Percent	Comments
Calcium carbonate	5	3% dolomite, 2% calcite
Clay, other	80	replaces most of groundmass and phenocrysts
Sulfide, pyrite	2	euhedral sulfides grains in veins and phenocrysts

THIN SECTION LABEL ID: **368-U1502B-15R-1-W 116/119-TSB-TS45** Thin section no.: 45
 Observer: SMS, FMZ
 Unit/subunit: VIb/2b
 Thin section summary: Highly-moderately altered, highly plagioclase-phyric coarse-grained basalt with partly glomeroporphyritic textures. Plagioclase phenocrysts are euhedral and equant to subequant. May contain chlorite-rich pseudomorphs after a ferromagnesian mineral (ol or opx?). Epidote, sulfides, sericite, chlorite (?) and carbonate (?) common secondary phases.

Plane-polarized: 41717781



Cross-polarized: 41717801



Igneous Petrology

Lithology: highly plagioclase phyric basalt **Groundmass grain size (avg.):** medium-grained
Texture: porphyritic **Grain size distribution:** inequigranular

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	60	40	20	0.25	7	euhedral	equant	sometimes glomeroporphyritic. potentially altered or devitrified melt inclusions in the Pl phenocrysts

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	40	20	20	0.1	1	subhedral	tabular	tightly interwoven, in part outlining the margins of the phenocrysts (indicating flow)
Fe-Ti oxide	3	1	2	0.01	0.07	subhedral	equant	replaced by Fe-hydroxides

Alteration

Alteration intensity: moderate **Total alteration (%):** 50 **Domain ID (if >1):**

Alteration domain comment: epidotite, sulfide, and sericite/illite are dominant secondary phases. Possibly some carbonate and chlorite

Alteration mineral	Percent	Comments
Clay, other	20	in groundmass
Epidote	1	also replacing phenocrysts
Sericite	20	most of the groundmass and in plagioclase
Sulfide, pyrite	1	euhedral sulfide in various sized distributed throughout

THIN SECTION LABEL ID: **368-U1502B-16R-1-W 105/108-TSB-TS41**

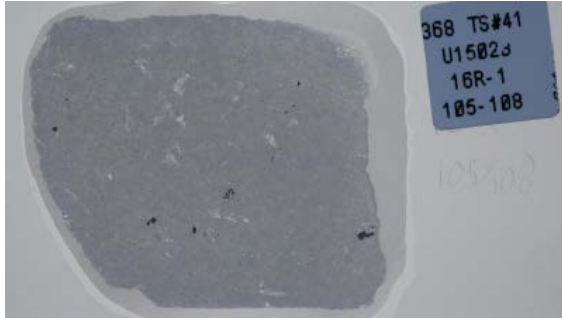
Thin section no.: 41

Observer: SMS, KAD

Unit/subunit: VIb/2b

Thin section summary: Highly altered, sparsely plagioclase-phyric basalt with mm-sized elongate euhedral plagioclase phenocrysts. Groundmass mostly turned to clay. Quench textures with swallow tail plagioclase in the groundmass.

Plane-polarized: 41708501



Cross-polarized: 41708521



Igneous Petrology

Lithology: sparsely plagioclase phyric basalt **Groundmass grain size (avg.):** fine-grained

Texture: interstitial **Grain size distribution:** bimodal

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	3	0.5	2.5	0.5	1	euhedral	tabular	

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	50	10	30	0.4	0.6	subhedral	elongate	tightly interwoven

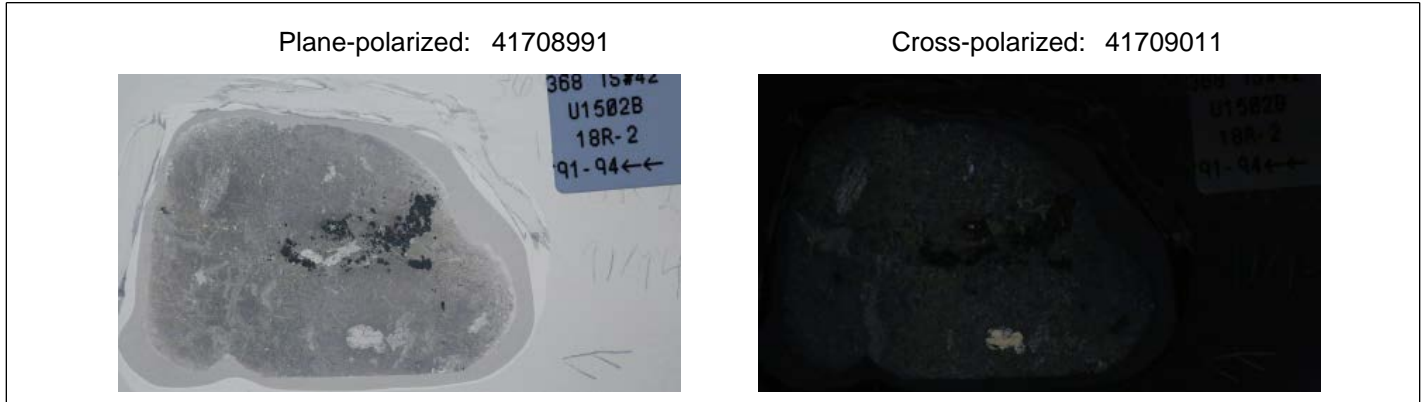
Alteration

Alteration intensity: high **Total alteration (%):** 75 **Domain ID (if >1):**

Alteration domain comment: mostly clay minerals, rare epidote, calcite, sulfide

Alteration mineral	Percent	Comments
Calcium carbonate	1	
Clay, other	74	replaces groundmass and phenocrysts
Epidote	1	only 2 grains
Sulfide, pyrite	2	euhedral sulfides grains in groundmass and phenocrysts

THIN SECTION LABEL ID: **368-U1502B-18R-2-W 91/94-TSB-TS42** Thin section no.: 42
 Observer: SMS, FMZ, KAD
 Unit/subunit: VIb/2b
 Thin section summary: Highly altered sparsely plagioclase-phyric basalt with originally (partially devitrified) glassy rim with swallow-tail and bow-tie plagioclase and perlitic cracking. Abundant secondary zeolitization in original glass rim and basalt. Groundmass nearly completely overprinted by alteration (with epidote). Vein rich in pyrite.



Igneous Petrology

Lithology: sparsely plagioclase phyric basalt pillow lava flow **Groundmass grain size (avg.):** fine-grained

Texture: hypocrySTALLINE **Grain size distribution:** bimodal

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	2	1	1	0.3	5	euhedral	tabular	twinning

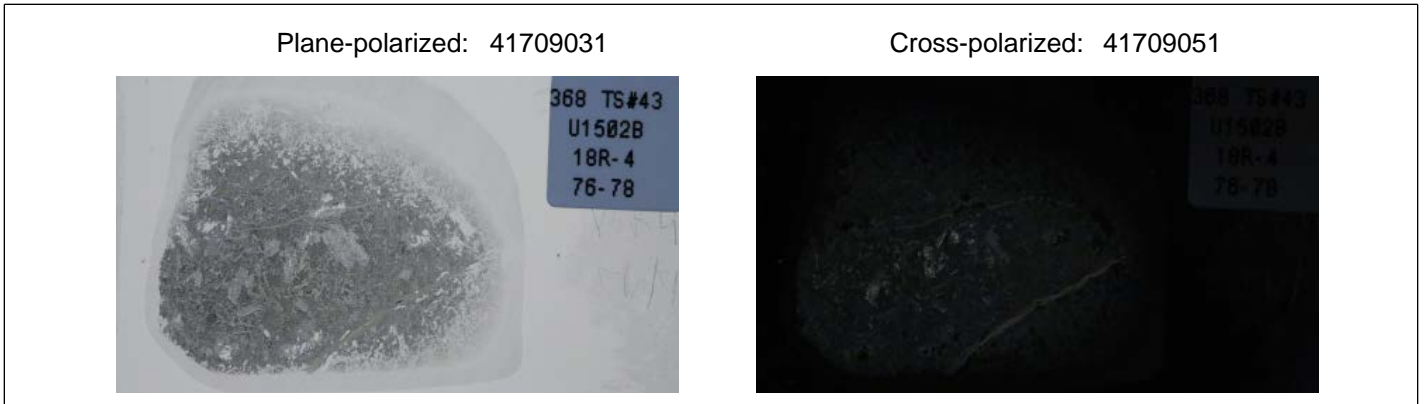
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	30	5	25	0.1	0.5	subhedral	tabular	most plagioclase is mostly destroyed by alteration, and only ghost textures are recognizable in groundmass

Alteration

Alteration intensity: high **Total alteration (%):** 90 **Domain ID (if >1):**

Alteration mineral	Percent	Comments
Clay, other	40	may be present together with zeolite
Epidote	10	in groundmass
Sulfide, pyrite	4	euhedral sulfides concentrated in veins, or possibly pipe vesicles
Zeolite	50	replacing primarily glass rim, but also crystalline groundmass, but also phenocrysts in glass rim

THIN SECTION LABEL ID: **368-U1502B-18R-4-W 76/78-TSB-TS43** Thin section no.: 43
 Observer: SMS, FMZ
 Unit/subunit: VIb/2b
 Thin section summary: Pervasively altered moderately plagioclase-phyric basalt. Millimeter-sized large subequant to tabular plagioclase phenocrysts sometimes with glomeroporphyritic appearance. Groundmass of tightly interwoven plagioclase. Secondary minerals are chlorite and epidote (possibly clay minerals); chlorite veining and impregnation followed by calcite and epidote veins.



Igneous Petrology

Lithology: moderately plagioclase phyric basalt **Groundmass grain size (avg.):** fine-grained
Texture: interstitial **Grain size distribution:** bimodal

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	10	5	5	1	5	euohedral	tabular	carlsbad twinning; sometimes glomeroporphyritic

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	50	25	25	0.1	0.9	euohedral	elongate	tightly interwoven
Fe-Ti oxide	5	1	4	0.001	0.03	euohedral	equant	replaced by Fe-hydroxides?

Alteration

Alteration intensity: high **Total alteration (%):** 65 **Domain ID (if >1):**
Alteration domain comment: chlorite, epidote, calcite, and possibly clay minerals, no sulfides

Alteration mineral	Percent	Comments
Calcium carbonate	2	calcite or dolomite
Chlorite	30	replaces groundmass and plagioclase phenocrysts; is followed by calcite/dolomite and epidote
Clay, other	30	replaces groundmass
Epidote	5	grains along veins and in groundmass and phenocrysts

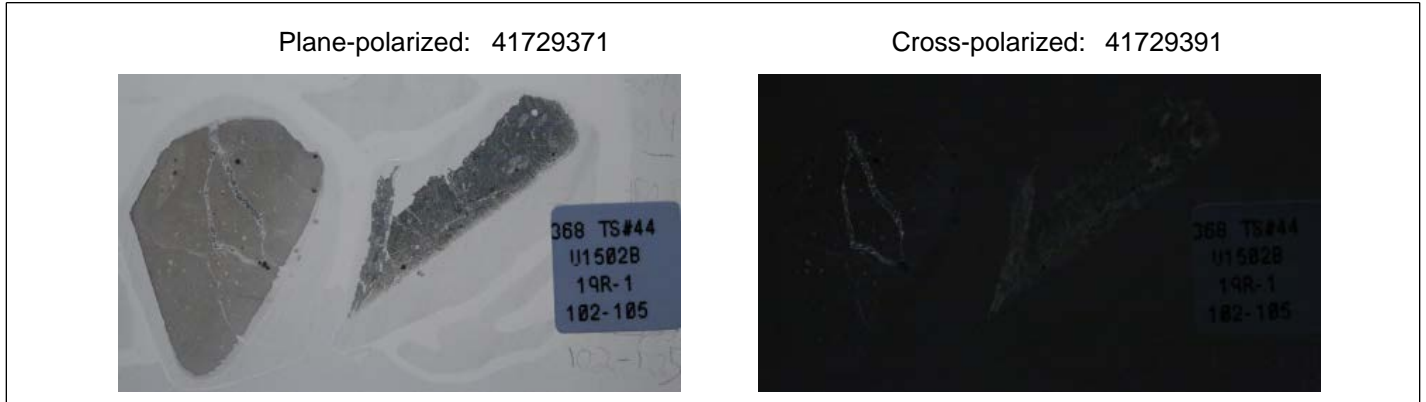
Veins and Halos

Vein type: composite vein **Vein boundary:** sharp boundary or contact
Avg. thickness (cm): 0.1 **Vein texture:** polycrystalline

Vein fill composition	Percentage
Calcium carbonate	60
Chlorite	45
Epidote	5

Vein comments: epidote and calcite follows chlorite

THIN SECTION LABEL ID: **368-U1502B-19R-1-W 102/105-TSB-TS44** Thin section no.: 44
 Observer: SMS, KAD
 Unit/subunit: VIb/2b
 Thin section summary: Highly altered sparsely plagioclase-phyric basalt with pillow rim. Basalt is silicified and strongly altered. Pillow rim highly altered with residual plagioclase. Secondary minerals are zeolite minerals, epidote and albite in veins, and clay minerals, pyrite and minor sphalerite.



Igneous Petrology

Lithology: sparsely plagioclase phyric basalt pillow lava flow **Groundmass grain size (avg.):** medium-grained

Texture: porphyritic **Grain size distribution:**

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	5	0.1	0.9	0.6	2	euhedral	tabular	only preserved in glassy rim

Alteration

Alteration intensity: high **Total alteration (%):** 90 **Domain ID (if >1):**

Alteration domain comment: epidote, zeolites (might have replaced chlorite), clay minerals, albite

Alteration mineral	Percent	Comments
Clay, other	50	replaces most of the fine-grained basalt
Epidote	1	
Sulfide, pyrite	1	
Zeolite	5	in veins, maybe replacing chlorite

Veins and Halos

Vein type: dendritic vein **Vein boundary:** sharp boundary or contact

Avg. thickness (cm): 0.05 **Vein texture:** polycrystalline

Vein comments: epidote, zeolites, albite

THIN SECTION LABEL ID: **368-U1502B-23R-2-W 65/67-PMAG_TSB-TSB-TS46** Thin section no.: 45
 Observer: SMS, KAD
 Unit/subunit: VIb/2b
 Thin section summary: Highly altered, sparsely plagioclase-phyric basalt. Groundmass of tightly interwoven plagioclase laths. Abundant chlorite, epidote, zeolite, sericite, quartz replacing plagioclase phenocrysts, groundmass of plagioclase and interstitial spaces. Minor pyrite and chalcopyrite.



Igneous Petrology

Lithology: sparsely plagioclase phyric basalt **Groundmass grain size (avg.):** fine-grained
Texture: interstitial **Grain size distribution:** inequigranular

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	1	0.2	0.8	0.4	1.2	euhedral	subequant	mostly replaced by sericite, and other secondary minerals

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	50	15	35	0.01	1	subhedral	elongate	tightly interwoven
Fe-Ti oxide	5	3	2	0.05	0.1	euhedral	subequant	replaced by Fe-hydroxides?

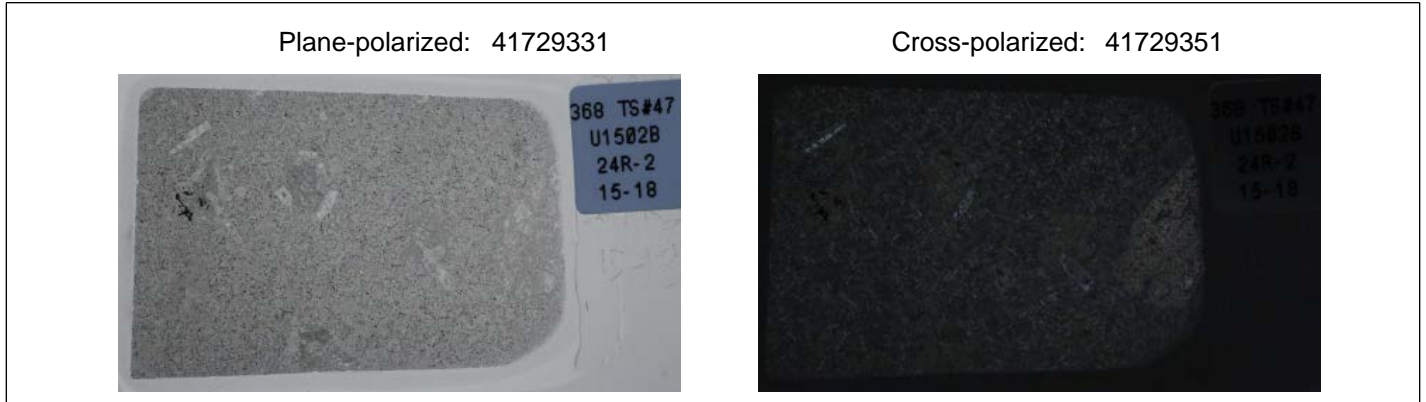
Alteration

Alteration intensity: high **Total alteration (%):** 85 **Domain ID (if >1):**

Alteration domain comment: chlorite, epidote, quartz, sericite, clay minerals, sulfides

Alteration mineral	Percent	Comments
Chlorite	15	replaces groundmass and phenocrysts
Epidote	2	
Quartz	2	
Sericite	5	
Sulfide, pyrite	1	
Zeolite	5	

THIN SECTION LABEL ID: **368-U1502B-24R-2-W 15/18-TSB-TS47** Thin section no.: 47
 Observer: SMS
 Unit/subunit: VIb/2b
 Thin section summary: Highly altered moderately plagioclase-phyric basalt with large (> 5 mm), much altered, residually fresh plagioclase phenocrysts with glomeroporphyritic textures. Pervasively altered with abundant secondary minerals of carbonate, epidote, pyrite, sericite, zeolite and other clay minerals.



Igneous Petrology

Lithology: moderately plagioclase phyric basalt **Groundmass grain size (avg.):** fine-grained

Texture: porphyritic **Grain size distribution:** bimodal

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	4	1	3	1.2	8	subhedral	tabular	mostly replaced by carbonate, epidote and sericite

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	50	15	35	0.3	1.2	subhedral	elongate	tightly interwoven

Alteration

Alteration intensity: high **Total alteration (%):** 85 **Domain ID (if >1):**

Alteration domain comment: carbonate, epidote, sericite, sulfide, zeolite, quartz

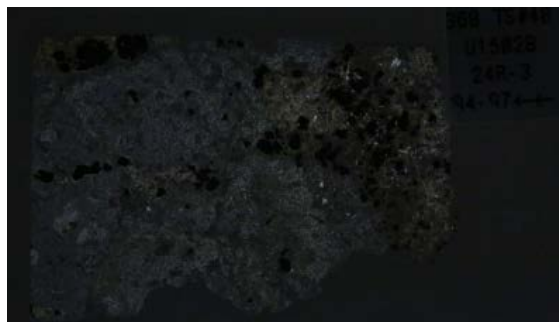
Alteration mineral	Percent	Comments
Calcium carbonate	2	calcite or dolomite
Clay, other	10	
Epidote	2	
Quartz	1	
Sericite	5	
Sulfide, pyrite	2	
Zeolite	3	

THIN SECTION LABEL ID: **368-U1502B-24R-3-W 94/97-TSB-TS48** Thin section no.: 48
 Observer: FMZ, KAD
 Unit/subunit: VIb/2b
 Thin section summary: Highly altered (by epidote/chlorite and clay minerals) sparsely plagioclase-phyric basalt crosscut by hydrothermal vein/domain consisting of carbonate, epidote, quartz and sulfides, surrounded by a halo of chlorite/epidote alteration. Sparse up to 3 mm plag phenocrysts are (sub)equant. Plag in the groundmass show relict quench textures suggesting the groundmass was originally glassy. Relict perlitic cracking in groundmass confirms glassy groundmass. Sulfide is pyrite.

Plane-polarized: 41749251



Cross-polarized: 41749271



Igneous Petrology

Lithology: sparsely plagioclase phyric basalt Groundmass grain size (avg.): fine-grained
 Texture: interstitial Grain size distribution: inequigranular

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	10	4	6	0.5	5	euhedral	equant	Carlsbad twinning

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	50	10	40	0.1	0.4	euhedral	elongate	tightly interwoven
Fe-Ti oxide	5	0	5	0.01	0.03	subhedral	equant	replaced by Fe-hydroxides?

Igneous Petrology

Lithology: sparsely plagioclase phyric basalt Groundmass grain size (avg.):
 Texture: Grain size distribution:

Alteration

Alteration intensity: high Total alteration (%): 95 Domain ID (if >1):
 Alteration domain comment: epidote, chlorite, carbonate, clay-minerals

Alteration mineral	Percent	Comments
Calcium carbonate	10	calcite or dolomite
Chlorite	30	replaces groundmass
Clay, other	30	replaces groundmass
Epidote	30	close to the veins and as fine grained groundmass

Alteration

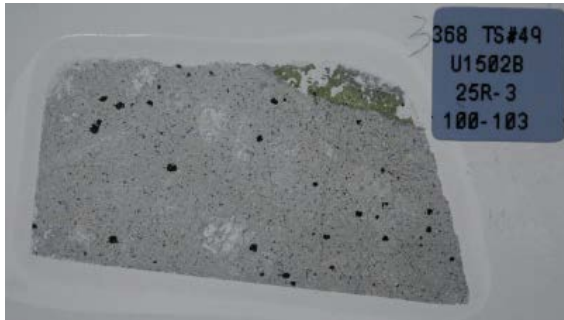
Alteration intensity: complete **Total alteration (%):** 95 **Domain ID (if >1):**

Alteration domain comment: epidote, sulfide, carbonate, chlorite, silica

Alteration mineral	Percent	Comments
Calcium carbonate	30	calcite or dolomite
Chlorite	20	forms a halo around the carbonate-sulfide-epidote vein
Epidote	20	in center of the vein, intergrown with sulfides and carbonates
Quartz	10	loose crystals in the vein, and finer grained quartz vein
Sulfide, pyrite	20	euhedral sulfides in vein, pyrite or sphalerite?

THIN SECTION LABEL ID: **368-U1502B-25R-3-W 100/103-TSB-TS49** Thin section no.: 49
 Observer: SMS, KAD
 Unit/subunit: VIb/2b
 Thin section summary: Highly altered moderately plagioclase-phyric basalt with large (> 5 mm), much altered, residually fresh plagioclase phenocrysts with glomeroporphyritic textures. Pervasively altered with abundant secondary minerals of carbonate, epidote, pyrite, sericite, zeolite and other clay minerals. Cross-cut by epidote-rich vein with quartz, carbonate and pyrite. Possible pseudomorphs after olivine. Intersertal mineral was probably clinopyroxene.

Plane-polarized: 41749291



Cross-polarized: 41749311



Igneous Petrology

Lithology: moderately plagioclase phyric basalt **Groundmass grain size (avg.):** fine-grained
Texture: glomeroporphyritic **Grain size distribution:** bimodal

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	7	2	5	1.2	6	euhedral	subequant	twinning, outlined by plagioclase microliths

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	50	15	35	0.15	0.6	subhedral	elongate	tightly interwoven

Alteration

Alteration intensity: high **Total alteration (%):** 80 **Domain ID (if >1):**

Alteration domain comment: carbonate, sericite, zeolite, chlorite (?), clay minerals. sulfide, clay minerals, quartz

Alteration mineral	Percent	Comments
Calcium carbonate	5	calcite or dolomite
Chlorite	1	
Clay, other	30	replaces groundmass
Quartz	3	
Sericite	10	replacing plagioclase
Sulfide, pyrite	5	euhedral sulfide disseminated
Zeolite	5	

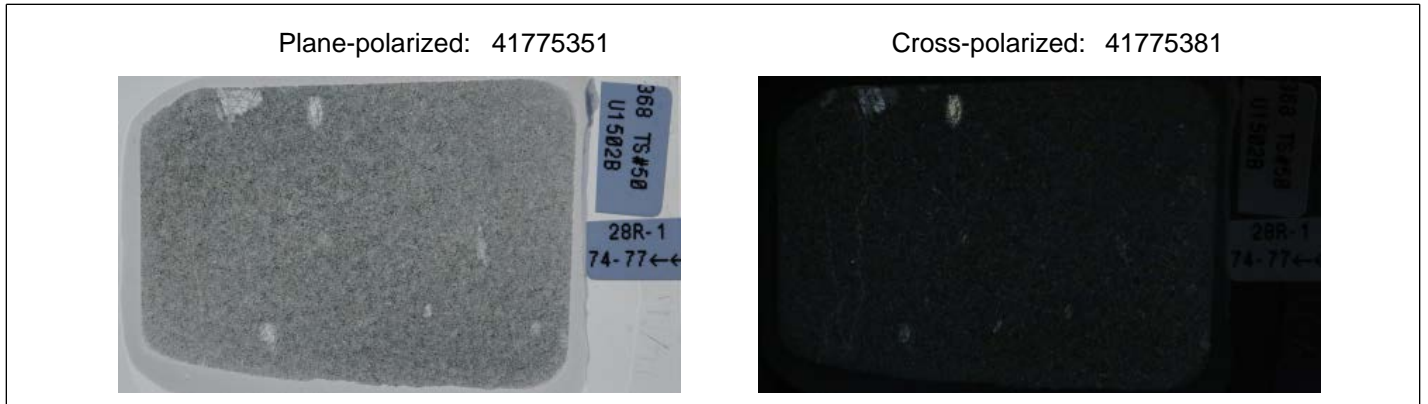
Veins and Halos

Vein type: composite vein **Vein boundary:** sharp boundary or contact
Avg. thickness (cm): 0.02 **Vein texture:** polycrystalline

Vein fill composition	Percentage
Calcium carbonate	5
Epidote	85
Quartz	1
Sulfide	1

Vein comments: epidote (dominant), carbonate (dolomite), sulfides, quartz

THIN SECTION LABEL ID: **368-U1502B-28R-1-W 74/77-TSB-TS50** Thin section no.: 50
 Observer: RMK, FMZ
 Unit/subunit: VIb/2b
 Thin section summary: Very fine-grained highly altered basalt, sparsely plagioclase-phyric. Some minor partially replaced plagioclase phenocrysts within a groundmass formed by plagioclase, chlorite, clinozoisite, and opaque minerals. Larger chlorite crystals are pleochroic in pale green colors. Finer grains often indistinguishably interwoven with clinozoisite. Vesicles are filled with chlorite and epidote. Some thin carbonate veins cross-cut the thin section.



Igneous Petrology

Lithology: sparsely plagioclase phyric basalt **Groundmass grain size (avg.):** fine-grained
Texture: porphyritic **Grain size distribution:** bimodal

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	2	1.6	0.4	2	3	subhedral	tabular	Carlsbad and albite twinning common. Partially replaced by epidote.

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	40	20	20	0.05	0.3	subhedral	elongate	tightly interwoven
Fe-Ti oxide	15	10	5	0.01	0.1	subhedral	equant	replaced by Fe-hydroxides?

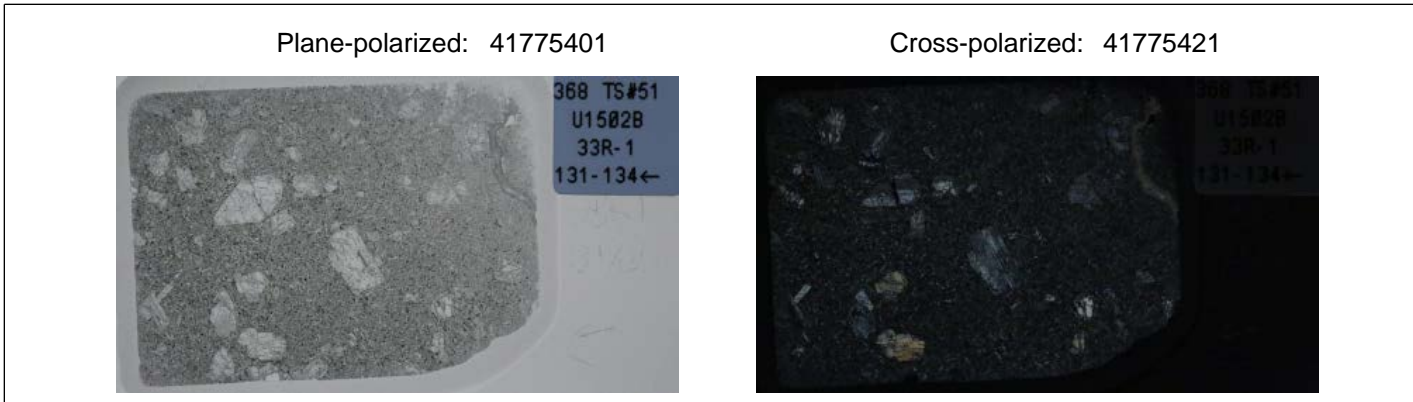
Alteration

Alteration intensity: high **Total alteration (%):** 80 **Domain ID (if >1):**

Alteration domain comment: groundmass altered to chlorite, clay minerals and epidote. Phenocrysts altered to epidote. Crosscut by carbonate vein.

Alteration mineral	Percent	Comments
Calcium carbonate	1	in thin veins
Chlorite	40	replaces groundmass
Clay, other	49	replaces groundmass
Epidote	5	replaces groundmass and phenocrysts
FeOOH	5	in groundmass

THIN SECTION LABEL ID: **368-U1502B-33R-1-W 131/134-TSB-TS51** Thin section no.: 51
 Observer: RMK, FMZ, KAD
 Unit/subunit: VIb/2b
 Thin section summary: Highly altered highly plagioclase phyric basalt. Groundmass consists of largely pale green pleochroitic chlorite, plagioclase and opaque minerals (rare pyrite). Plagioclase porphyroclasts are partly replaced by epidote and other cryptocrystalline alteration minerals. crosscut by carbonate vein. Regular areas with green alteration minerals may be pseudomorphs after a ferromagnesian mineral.



Igneous Petrology

Lithology: highly plagioclase phyric basalt **Groundmass grain size (avg.):** fine-grained
Texture: porphyritic **Grain size distribution:** bimodal

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	20	15	5	0.5	5	euhedral	tabular	carlsbad and albite twinning common. potentially altered/devitrified melt inclusions in the phenocrysts

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	50	30	20	0.1	0.9	subhedral	elongate	tightly interwoven
Fe-Ti oxide	7	5	2	0.01	0.1	subhedral	equant	replaced by Fe-hydroxides?

Alteration

Alteration intensity: high **Total alteration (%):** 70 **Domain ID (if >1):**

Alteration domain comment: groundmass altered to chlorite, clay minerals, epidote. Phenocrysts altered to epidote. Carbonate vein.

Alteration mineral	Percent	Comments
Calcium carbonate	1	in vein
Chlorite	35	replaces groundmass
Clay, other	49	replaces groundmass
Epidote	10	replaces groundmass and phenocrysts
FeOOH	5	in groundmass

THIN SECTION LABEL ID: **368-U1502B-34R-1-W 89/91-PMAG_TSB-TSB-TS52** Thin section no.: 52
 Observer: FMZ
 Unit/subunit: VIb/2b
 Thin section summary: Moderately plagioclase phyric basalt, moderately altered to chlorite, clay minerals and epidote. Crosscut by smaller veins of carbonate, epidote and chlorite. Plagioclase groundmass tightly interwoven with alteration minerals.



Igneous Petrology

Lithology: moderately plagioclase phyric basalt **Groundmass grain size (avg.):** fine-grained
Texture: porphyritic **Grain size distribution:** bimodal

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	10	3	7	0.5	5	euhedral	tabular	Carlsbad and albite twinning common. Minor zoning. Partially replaced by epidote and chlorite.

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	50	35	15	0.1	0.7	subhedral	elongate	tightly interwoven
Fe-Ti oxide	10	5	5	0.01	0.05	subhedral	equant	replaced by Fe-hydroxides?

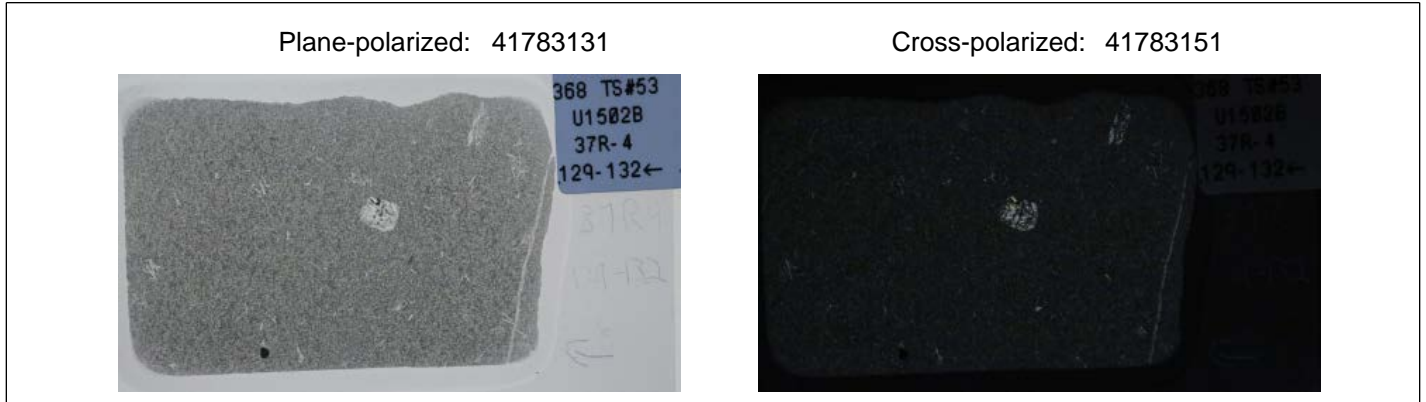
Alteration

Alteration intensity: moderate **Total alteration (%):** 60 **Domain ID (if >1):**

Alteration domain comment: groundmass altered by chlorine, clay minerals and epidote, phenocrysts by chlorine and epidote. Crosscut by carbonate, epidote and chlorine veins.

Alteration mineral	Percent	Comments
Calcium carbonate	2	in veins
Chlorite	50	replaces groundmass, in veins
Clay, other	40	replaces groundmass
Epidote	3	replaces phenocrysts and in veins
FeOOH	5	in groundmass

THIN SECTION LABEL ID: **368-U1502B-37R-4-W 129/132-TSB-TS53** Thin section no.: 53
 Observer: FMZ, KAD
 Unit/subunit: VIb/2b
 Thin section summary: Fine-grained, sparsely plagioclase phyric and glomeroporphyritic basalt. Moderately-highly altered by chlorite, epidote, clay minerals. Crosscut by carbonate vein. Quench textured plagioclase in the groundmass suggest it was originally glassy. Minor pyrite, chalcopyrite and sphalerite.



Igneous Petrology

Lithology: sparsely plagioclase phyric basalt **Groundmass grain size (avg.):** fine-grained
Texture: porphyritic **Grain size distribution:** bimodal

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	2	1.6	0.4	0.5	3	subhedral	tabular	carlsbad twinning common

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	50	25	25	0.05	0.7	subhedral	elongate	tightly interwoven
Fe-Ti oxide	7	5	2	0.005	0.02	subhedral	equant	replaced by Fe-hydroxides?

Alteration

Alteration intensity: high **Total alteration (%):** 70 **Domain ID (if >1):**

Alteration domain comment: groundmass altered by chlorite, epidote and clay minerals. Phenocrysts mostly by epidote. Crosscut by carbonate vein.

Alteration mineral	Percent	Comments
Calcium carbonate	1	in vein
Chlorite	40	replaces groundmass
Clay, other	52	replaces groundmass
Epidote	5	replaces groundmass and phenocrysts
FeOOH	3	in groundmass